your Gateway 820 LTO autoloader

user's guide

Installing | Configuring | Gateway®

Contents

1 Introduction

The autoloader provides automated data storage, archiving, backup, and retrieval for a range of systems, from offices to rack-based datacenter environments.

Read this chapter to learn about:

- Autoloader features
- Autoloader accessories

Features

- A carousel that positions the specified cartridge slot in front of the tape drive. A robotic cartridge loader moves the cartridges between the cartridge slots and the tape drive.
- Storage for as many as eight data cartridges. Cartridges are stored in cartridge slots mounted on the carousel. One of these cartridge slots can contain a cleaning cartridge.
- A cartridge access door for importing or exporting a single cartridge from the autoloader.
- A LCD that lets you monitor autoloader operations, select configuration options, and control the cartridge loader and carousel from the front panel.
- Independent SCSI controllers for the autoloader and tape drive. Each controller supports independent sets of SCSI messages and commands. The autoloader and the tape drive use a wide, low-voltage differential (LVD) SCSI interface.
- Compatibility with single-ended SCSI cables.

Physical Characteristics and Features	
Drive technology	LTO Ultrium 1
Total drives	1
Maximum storage cartridges	8
cartridge access door	1
LCD size and type	Two-line with 16 character per line, ASCII
LCD user interface	Four-button keypad
Maximum capacity (compressed capacity assumes a theoretical maximum 2:1 compression ratio)	1.6 TB/800 GB (compressed/native)
Maximum sustained data transfer rate MB/sec	32/16 (compressed/native)
Maximum SCSI bus connections	1
SCSI connector type	68-pin high-density connector (HDCI)

Parallel SCSI Communication Interface	
Low-voltage differential (LVD) + SE	Yes
Maximum SCSI bus connections	1

Accessories

The autoloader comes with:

- Power cord
- One wide SCSI-3 (HDCI-HDCI) cable
- One wide SCSI-3 (VHDCI-HDCI) cable
- One LTO-1 100/200 GB tape cartridge
- One LTO-1 cleaning cartridge
- One LVD wide SCSI terminator (included in some configurations).
- *Server Companion CD*. The CD contains autoloader documentation and diagnostic software for the tape drive and autoloader, including firmware upgrade capability. See the online documentation on the CD for details about installation and operation of the software.

Optional accessories

- Cabinet mount kit — The cabinet (rack) mount kit includes all the necessary hardware to mount the autoloader in a standard 19-inch EIA 310-D cabinet. The autoloader occupies two rack units (2U).
- LTO-1 100/200 GB tape cartridges

2 Quick Start

Read this chapter to learn about:

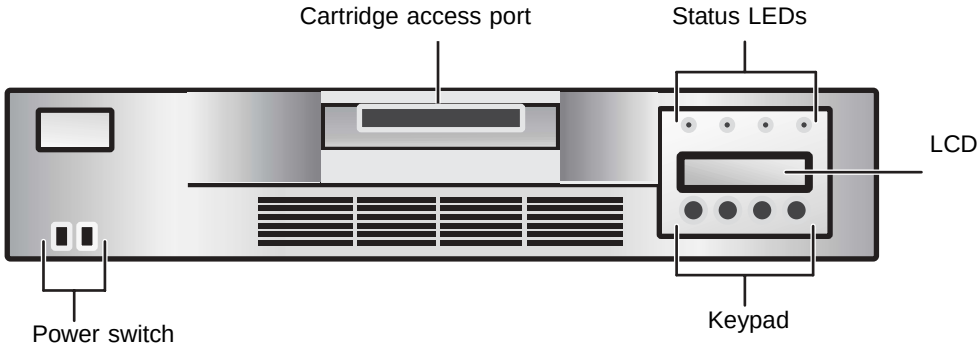
- Safety precautions
- Components and connectors
- Starting the autoloader
- Using the Operator's Panel
- Installing cartridges

Warnings

Read all safety and operating instructions before you use the autoloader and retain the instructions for future reference. This autoloader has been engineered and manufactured to assure your personal safety. Incorrect use can result in electrical shock or fire hazards. In order not to defeat the safeguards, observe the following basic rules for installation, use, and servicing.

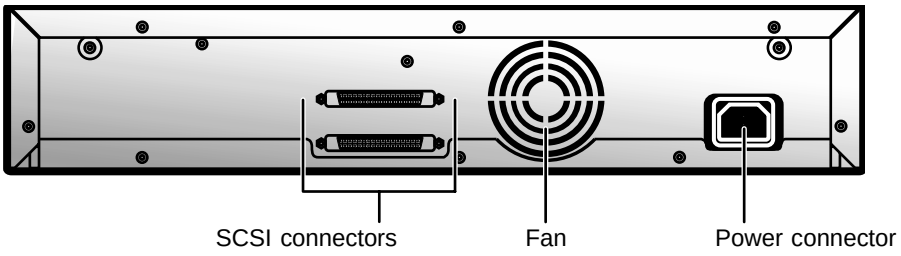
- Heed all warnings on the autoloader and in the operating instructions.
- Follow all operating instructions.
- Place the autoloader on a firm, level surface free from vibration, and do not place anything on top of the autoloader.
- Make sure that the autoloader is positioned so it has correct ventilation.
- Keep the autoloader away from heat sources such as radiators, heat registers, furnaces, or other heat-producing appliances.
- Use only the type of power source described in this guide or marked on the autoloader.
- Do not rest objects on the power cord and avoid placing the power cord near high traffic areas. Hold the power cord by the plug when removing it from an AC outlet. Pulling the cord can damage the internal wires.
- To completely disconnect the power, remove the power cord and the SCSI cable from their connections on the back of the autoloader.
- Do not insert objects in the openings on the case.
- Do not let liquid spill in or on the autoloader.
- Do not attempt to service this autoloader except as directed in this guide. All other servicing should be referred to qualified service personnel. For information on servicing, contact Gateway Technical Support at support.gateway.com or at 877-485-1464.
- Do not use oil, solvents, gasoline, paint thinners, or insecticides on the autoloader.
- Do not expose the autoloader to temperatures higher than 140°F (60°C) or lower than -40°F (-40°C).
- Keep the autoloader away from direct sunlight, strong magnetic fields, excessive dust, humidity, and electronic or electrical equipment, which generate electrical noise.

Front



- **Cartridge access port** —Insert or remove cartridges through this port.
- **Status LEDs** — Provide information about various system functions. See “Status LEDs” on page 30 for more information.
- **LCD** — Displays two lines of text with 16 characters per line. The LCD displays actions, status information, menu items, and error messages, based on the operating mode. See “The Operator’s Panel” on page 13 for more information.
- **Keypad** — Press these buttons to perform various tasks in *interaction* mode. See “The Operator’s Panel” on page 13 for more information.
- **Power switch** — Turns the autoloader and the enclosed tape drive off and on. The switch is recessed into the front panel to prevent the autoloader from being accidentally turned off during operation.

Back



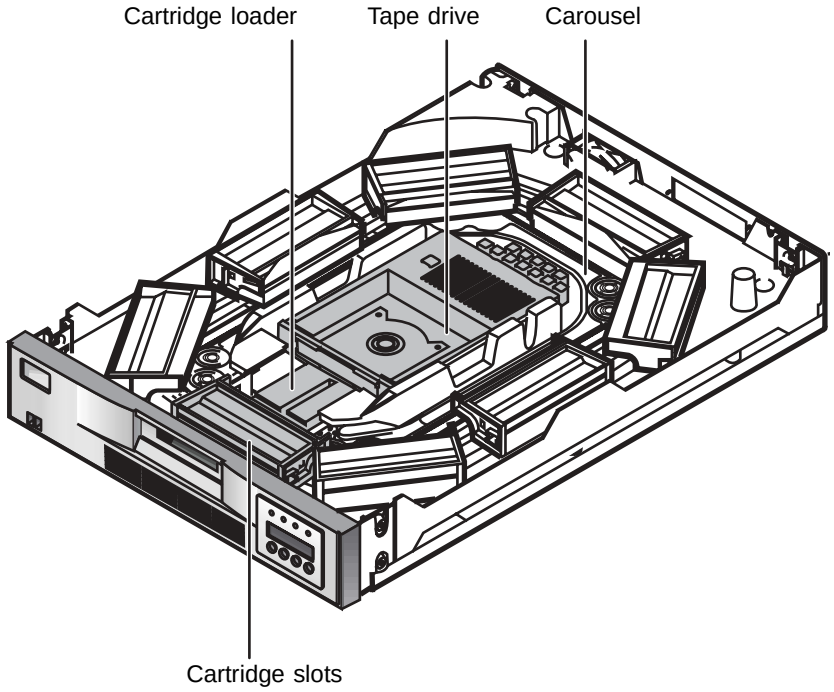
- **SCSI connectors** — Two wide SCSI connectors connect the autoloader and tape drive to a single SCSI bus. You can use either of the following:
  - A shielded, high-density, wide (68-pin) SCSI cable (For more information, see “SCSI interface” on page 52.)
  - An LVD or multi-node terminator.

  The wide SCSI configuration lets you attach as many as 16 devices (including one or more initiators) to a single SCSI bus.
- **Fan** — The system fan provides cooling for the autoloader and the tape drive.
- **Power connector** — The power connector provides AC power and chassis grounding to the autoloader and the tape drive.

Interior

Warning

Internal components are not serviceable except by a qualified service technician.



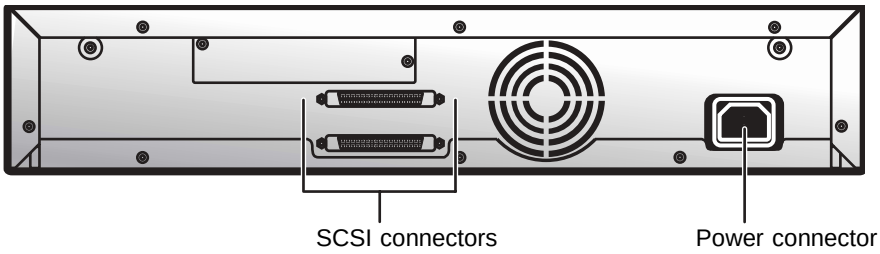
- **Cartridge loader** — The cartridge loader moves cartridges between the cartridge slots and the tape drive. When a cartridge slot is positioned in front of the tape drive, the loader grips the sides of the cartridge and slides it between the slot and tape drive. Then the loader releases the cartridge and pushes it firmly into the drive or slot.
- **Tape drive** — The autoloader contains one tape drive. The tape drive has a maximum data transfer rate of 32 MB (compressed) per second and can store up to 200 GB of compressed information on a single data cartridge (assuming an average compression ratio of 2:1).

- **Cartridge slots and carousel** — The carousel stores as many as eight data cartridges. The carousel consists of a drive chain, guides, and gears that move the cartridges into position in front of the tape drive and make sure that the cartridge is correctly aligned. You can use one cartridge slot to hold a cleaning cartridge.

Starting the autoloader

To start the autoloader:

1 Attach the power cord to the autoloader, then attach the other end to an AC outlet. For more information about the power cord, see “Power specifications” on page 57.



2 Connect the SCSI cable and the terminator. For more information about the SCSI interface, see “SCSI interface” on page 52.

a Connect one end of the SCSI cable to one of the SCSI connectors on the back of the autoloader.

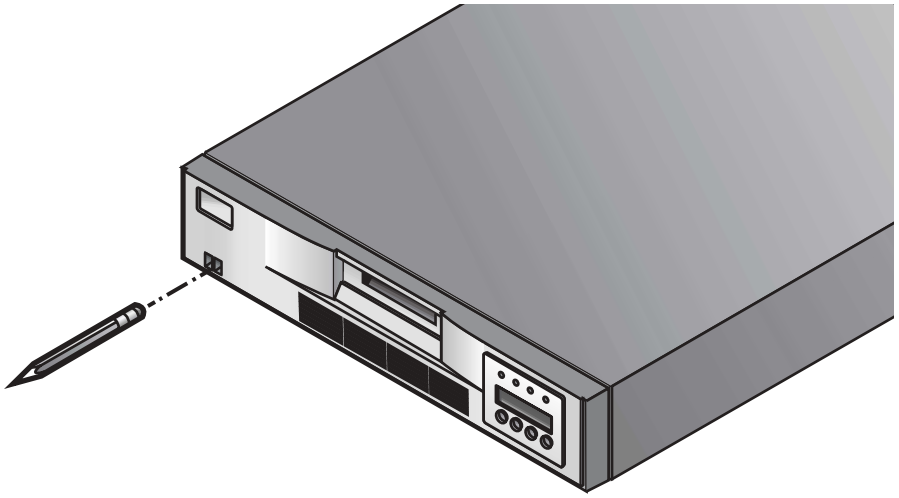
b Connect the other end of the SCSI cable to the SCSI connector on the SCSI host bus adapter or to the previous device on the SCSI bus.

c If this is the last device in the SCSI chain, connect the SCSI terminator to the remaining SCSI connector on the back of the autoloader.

SCSI ID Default Settings	
Autoloader	5
Tape drive	6

To change the SCSI ID settings, see “Changing the SCSI ID settings” on page 53.

3 Use the eraser end of a pencil, or something similar, to press the left side of the power switch. The autoloader turns on.



Important

The power switch lets you turn the autoloader and the enclosed tape drive on or off. The power switch is recessed into the front panel to prevent the autoloader from being accidentally turned off during operation.

When you turn on or reset the autoloader, it runs an initialization routine. During initialization, the Operator's Panel displays progress information. After initialization, the autoloader displays the mount status for the current drive and displays SEQ to indicate that the sequential mode is ON.

In addition, the appropriate inventory status characters appear. For more information, see "Inventory status characters" on page 33.

4 Start the host computer system.

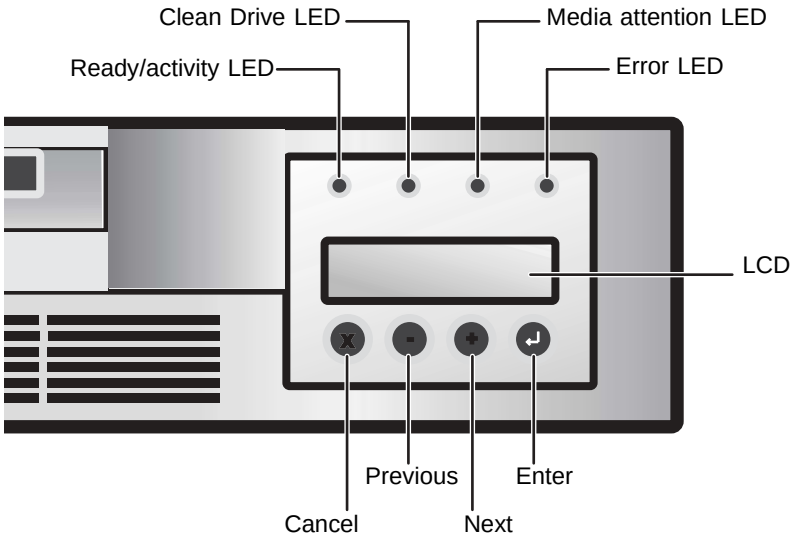
The Operator's Panel

The Operator's Panel consists of various status LEDs, an LCD, and keypad buttons.

The following keypad buttons are used to navigate the menu options:

- CANCEL button [X] — Cancel an action and return to the last menu item.
- PREVIOUS button [-] — Navigate through menu items.
- NEXT button [+] — Navigate through menu items.
- ENTER button — Go to a sub-menu or force a robotic action.

For more information about the Operator's Panel, see "The Operator's Panel" on page 30. For more information on the menu options, see "Menu options" on page 32.



Installing the data cartridges

Before you use the autoloader, you must install the data cartridges. For more information on data cartridges, see “Data cartridges” on page 27.

Warning

The tape drive only operates with LTO-1 Ultrium tape data cartridges. The cartridges are available in 100/200 GB size. Attempting to use other types of cartridges may damage the tape drive.

To install the data cartridges:

1. Press any button on the Operator’s Panel to change to *interaction* mode.
2. Select the **Commands** menu, then press **ENTER**.
3. Select **Import**, then press **ENTER**.
4. Enter the number of the cartridge slot, then press **ENTER**.
5. Insert the cartridge in the cartridge access port. The cartridge is now placed in the selected slot.
6. Repeat Steps 4 and 5 until all cartridges have been installed.

Setting Up the Autoloader

3

Read this chapter to learn how to:

- Install the autoloader in a cabinet (rack)
- Connect the cables
- Install the data cartridges
- Load and unload a cartridge
- Update the cartridge inventory

Choosing a location

Choose a location that meets the following criteria:

- Select a location that is flat, sturdy, level, and close to the host server. Do not place the autoloader on the floor or other carpeted surfaces.

Warning

Do not place the autoloader on its side or upside down, or stack items that weigh more than 33 lbs. (15 kg) on top of the autoloader.

- Cabinet (rack) requirements — EIA 310-D standard 19-inch cabinet with 2U of clearance
- Room temperature — 50 to 95ºF (10 to 35ºC)
- Power source — AC power voltage: 100-127 VAC; 200-240 VAC line frequency: 50-60 Hz

Important

Locate the AC outlet on the back of the autoloader. The power cord is the autoloader's main AC disconnect device and must be easily accessible at all times.

- Air quality — Minimal sources of particulate contamination. Avoid areas near frequently used doors and walkways, stacks of supplies that collect dust, printers, and smoke-filled rooms.

Warning

Excessive dust and debris can damage tapes and tape drives.

- Humidity — 20 to 80% RH non-condensing
- Clearance — Back: minimum of 6 inches (15.4 cm). Front: minimum of 12 inches (30.8 cm). Sides: minimum of 2 inches (5.08 cm).

Important

Save all the original packing materials, including the accessory box, in case you need to ship or move the autoloader at a later time.

Checking the installation environment

After choosing a location for the autoloader, consider the following:

- The maximum recommended ambient temperature for the autoloader is +50°F to +104°F (+10°C to +40°C). Install the autoloader in an environment compatible with this temperature.
- Make sure that the fan opening at the back of the autoloader and the vent openings in the front are free of cables and other obstructions.
- Make sure that the supply circuit is suitable for all equipment loads in the cabinet.
- Make sure that the outlet or power strip is correctly grounded.
- Make sure that the installation environment is free of conditions that could cause electrostatic discharge (ESD). If possible, use an antistatic mat and grounded static protection wristband during installation. If a mat and wristband are not available, touch a known grounded surface, such as a computer's metal chassis.

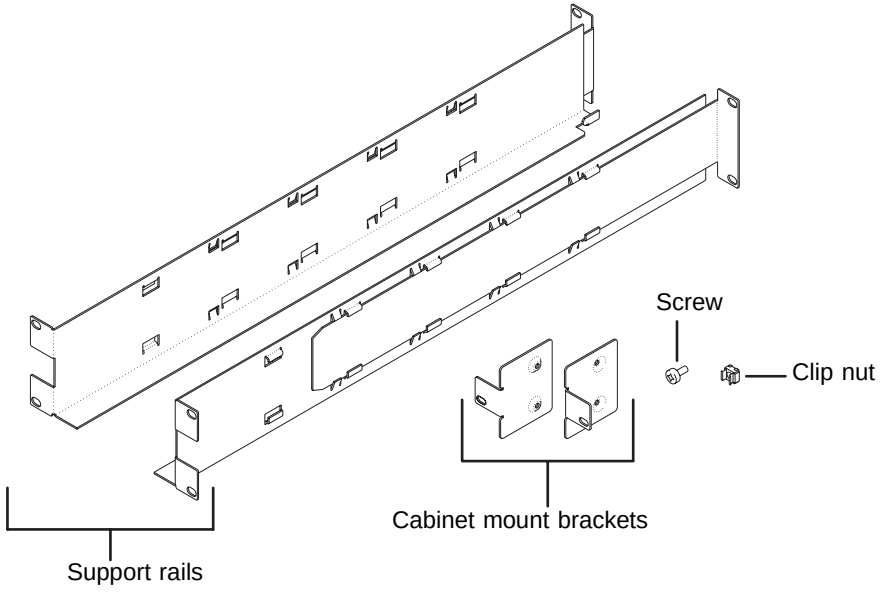
Installing the autoloader into a cabinet

The autoloader can be installed into an EIA 310-D standard 19-inch cabinet (rack).

Requirements

To install the autoloader into a cabinet, you need:

- #2 Phillips screwdriver
- TORX T-10 screwdriver
- The included cabinet mount kit — Make sure that the cabinet mount kit contains the following items:
  - Two support rails
  - Two cabinet mount brackets
  - Ten screws
  - Ten clip nuts



Preparing the autoloader

Warning

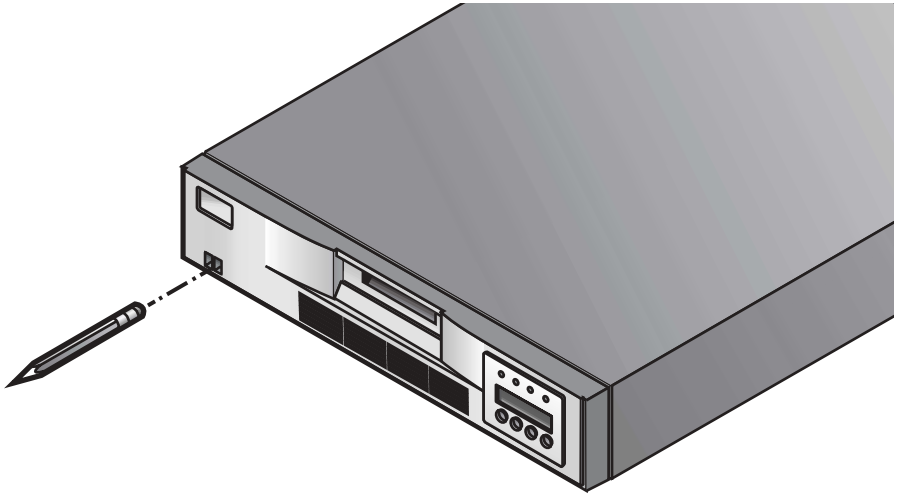
Before performing any installation or maintenance procedures, make sure that the autoloader is turned off and that the power cord is unplugged from the autoloader and the AC outlet.

To prepare the autoloader for installation:

1 Use the eraser end of a pencil, or a similar object, to press the right side of the recessed power switch on the front of the autoloader. This turns off the autoloader.

Important

To avoid disrupting communication between the host computer and other devices on the SCSI bus, make sure that there is no SCSI activity on the bus before you turn off the autoloader.



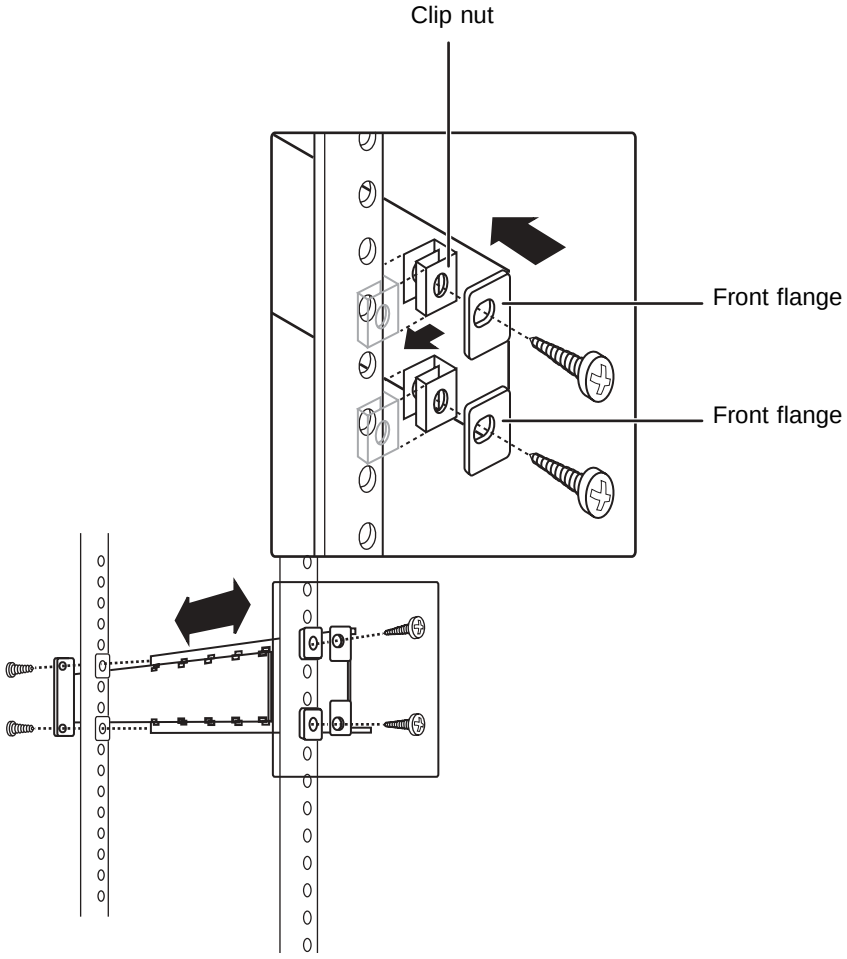
2 Remove the power cord and any SCSI cables or terminators attached to the autoloader. Note the configuration of the cables and terminator. You will reinstall them after installing the autoloader in the cabinet.

Installing the support rails

To install the support rails in the cabinet:

1. Remove the two support rails from the kit and note how they will be positioned in the cabinet. When the rails are installed, the shelf flanges will face inward to support the autoloader.
2. From the front of the cabinet, position one of the rails on the appropriate side. Slide the rail pieces apart to match the depth of your cabinet. Position the front flange so it is on the outside of the strip of mounting holes in the cabinet.

3 Using a #2 Phillips screwdriver, attach the rail to the cabinet with four of the screws from the kit. If your cabinet has square mounting holes, or the holes are larger than the screws provided in the kit, use the clip-nuts to secure the screws.



4 Repeat Steps 2 and 3 for the second rail.

Installing the cabinet mount brackets

To install the cabinet mount brackets on the autoloader:

1. Remove the cabinet mount brackets from the cabinet mount kit and determine which side of the autoloader you will attach them to:

   a. From the front of the cabinet, slide the autoloader partially onto the shelf flanges between the support rails you just installed.

   b. Holding one of the cabinet mount brackets against one side of the autoloader, line up the two holes in the bracket with the two screw holes on the side of the autoloader. The flange on the bracket should be toward the front of the autoloader, facing outward.

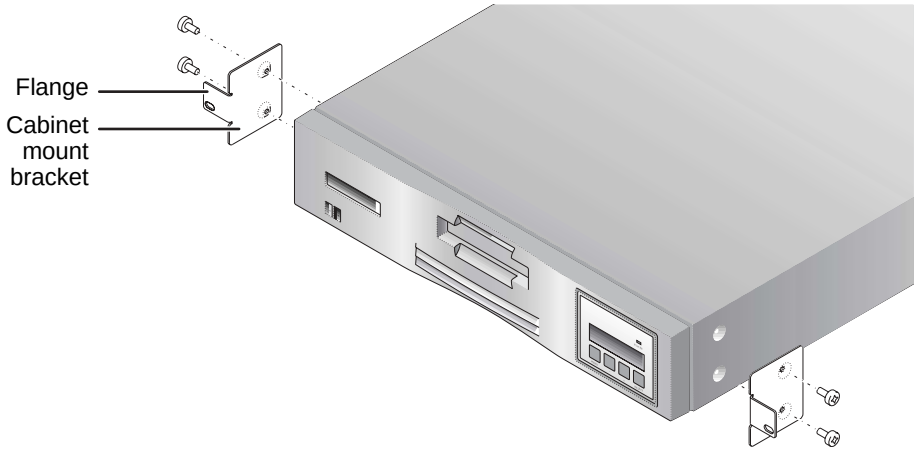
   c. Slide the autoloader into the cabinet until the bracket contacts the cabinet's mounting holes.

   d. Determine whether the screw hole on the bracket flange lines up with a mounting hole in the cabinet. If it does, you will mount the bracket on that side of the autoloader. If not, you will mount it on the other side of the autoloader.

2. Remove the autoloader from the shelf and place it on the work surface.

3. Using a TORX T-10 screwdriver, remove the two screws on each side of the autoloader.

4 Position the brackets on each side of the autoloader. Secure each bracket by replacing the original screws.

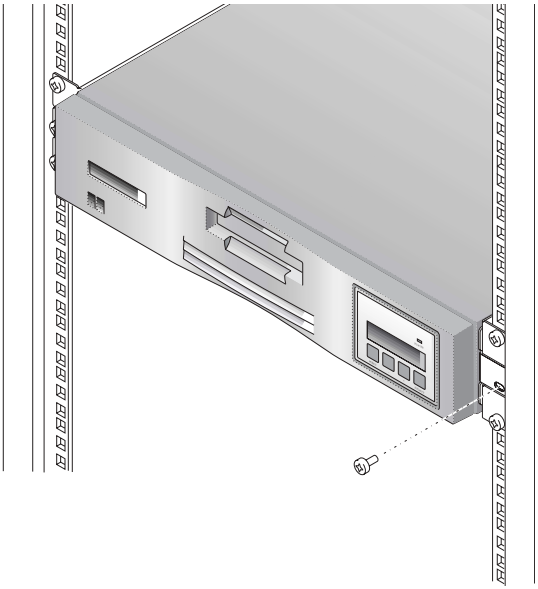


Securing the autoloader

To secure the autoloader to the cabinet:

1. From the front of the cabinet, position the autoloader on the shelf flanges between the support rails. Slide the autoloader toward the back of the cabinet until the brackets contact the cabinet's mounting holes. Make sure that the tabs on the back of each shelf flange are fully engaged in the slots at the back of the autoloader.

2. Place one screw from the cabinet mounting kit into the hole in the front of each bracket. If your cabinet has square mounting holes, or the holes are larger than the screws provided in the kit, use the clip-nuts to secure the screws. Use a #2 Phillips screwdriver to tighten the screws.



Connecting the cables

To connect the cables to the autoloader:

1. Choose the appropriate SCSI cable to use (two SCSI cables are supplied with your autoloader).

   - If you are connecting the autoloader to a device that uses a 68-pin HDC connector, use the cable that has HDC connectors on both ends.

     - OR -

   - If you are connecting the autoloader to a device that uses a high-density VHDC connector, use the cable that has the VHDC connector on one end and the HDC connector on the other.

2. Make sure that the autoloader is turned off (press the right side of the power switch).

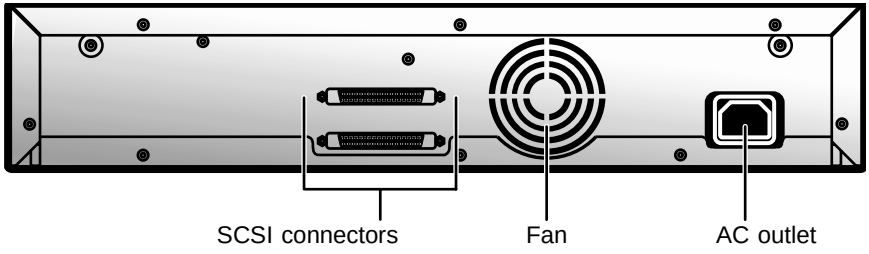
3. Connect the SCSI cable and the terminator. For more information about the SCSI interface, see “SCSI interface” on page 52.

   a. Connect one end of the SCSI cable to one of the SCSI connectors on the back of the autoloader.

   b. Connect the other end of the SCSI cable to the SCSI connector on the SCSI host bus adapter or on the previous device of the SCSI bus.

   c. If this is the last device in the SCSI chain, connect the SCSI terminator to the remaining SCSI connector on the back of the autoloader.

4. Connect one end of the power cord to the AC outlet on the back of the autoloader.



Important

The power cord that comes with the autoloader is a 120 VAC, three-conductor power cord for use in the United States and Canada.

5 Connect the other end of the power cord to the AC outlet.

6 Turn on the autoloader (press the left side of the power switch).

7 Turn on the host computer system.

Data cartridges

Installing the data cartridges

Warning

The tape drive and autoloader only operate with LTO-1 Ultrium tape data cartridges. Attempting to use other types of cartridges may damage the tape drive and autoloader.

Important

Do not open the front door of the autoloader unless you must perform interaction mode commands or change media. Use only LTO-1 Ultrium tape data cartridges. Clean the drive whenever necessary.

Warning

Never insert or remove cartridges from the cartridge slot unless READY/ACTIVITY is lit continuously (not flashing).

To install the data cartridges:

1. Press any button on the Operator's Panel to change to *interaction* mode.
2. Select the **Commands** menu, then press **ENTER**.
3. Select **Import**, then press **ENTER**.
4. Enter the number of the cartridge slot, then press **ENTER**.
5. Insert the cartridge in the cartridge access port. The cartridge is now placed in the selected slot.
6. Repeat steps 4 and 5 until all cartridges have been installed.

The *Import* command in the *Commands* menu lets you assign a cartridge to a specific cartridge slot. When you use the Import command, the cartridge carousel moves the specified cartridge slot into position in front of the cartridge access port and slides the door open. You can then push the cartridge into the slot through the door. The cartridge loader grasps the cartridge, pulls it into the autoloader, and closes the door.

The *Export* command lets you specify which cartridge you want to remove. When you use the Export command, the cartridge carousel moves the specified cartridge slot into position in front of the cartridge access port and slides the door open. The cartridge loader then pushes the cartridge far enough out to let you remove it.

Loading and unloading a cartridge

The *Load Cartridge* command in the *Commands* menu lets you specify which cartridge you want to load into the tape drive. When you use the Load Cartridge command, the cartridge carousel moves the specified cartridge slot into position in front of the tape drive. The cartridge loader then extracts the cartridge from the cartridge slot and inserts it into the tape drive.

The *Unload Cartridge* command makes the tape drive unload the cartridge from the tape drive and eject the cartridge. After the cartridge is ejected, the cartridge carousel moves the slot that the cartridge originated in into position in front of the tape drive. The cartridge loader then extracts the cartridge from the tape drive and returns it to the cartridge slot.

Updating the cartridge inventory

After you import or export a data cartridge, you can update the cartridge inventory using the *Re-inventory Option* command in the Commands menu. The autoloader checks for the presence of a cartridge in each cartridge slot.

Operating the Autoloader

4

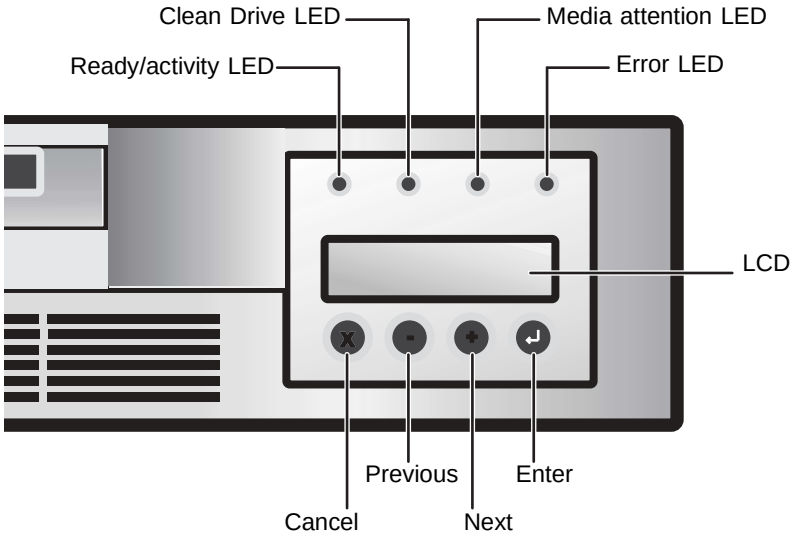
Read this chapter to learn about:

- The Operator's Panel
- Menu options
- Inventory status characters
- Operating modes
- Autoloader operations
- Maintenance and shipping

The Operator's Panel

The Operator's Panel consists of:

- Status LEDs
- LCD
- Keypad



Status LEDs

The LEDs are updated during power up and reset sequences. When you turn on the autoloader or do a software reset, the autoloader turns on all LEDs as soon as the power-on self-test (POST) allows.

When mechanical initialization starts, all LEDs turn off and the READY/ACTIVITY LED flashes at rate of approximately one second per cycle. When the mechanical initialization is complete, the READY/ACTIVITY LED stops flashing.

If a loader failure occurs, the READY/ACTIVITY LED turns off and the error LED turns on. The Operator's Panel also displays an appropriate error code to help identify the failure.

- READY/ACTIVITY (Green LED) — Lights any time the autoloader is turned on and able to function. It flashes whenever there is autoloader or drive activity.
- CLEAN DRIVE (Amber LED) — Lights when the drive needs to be cleaned. The LED turns off after the drive is cleaned successfully.
- MEDIA ATTENTION (Amber LED) — Lights when a cartridge is bad, marginal, or invalid. The LED turns off when all invalid cartridges are removed from the autoloader.
- ERROR (Red LED) — Lights when there is an unrecoverable autoloader or drive failure. A message appears at the same time on the screen. The LED turns off when the error state is resolved. For a list of error codes, see "Error codes" on page 43.

LCD (liquid crystal display)

The LCD consists of two lines, with 16 characters per line. The LCD displays actions, status information, menu items, and error messages based on the operation mode.

Keypad

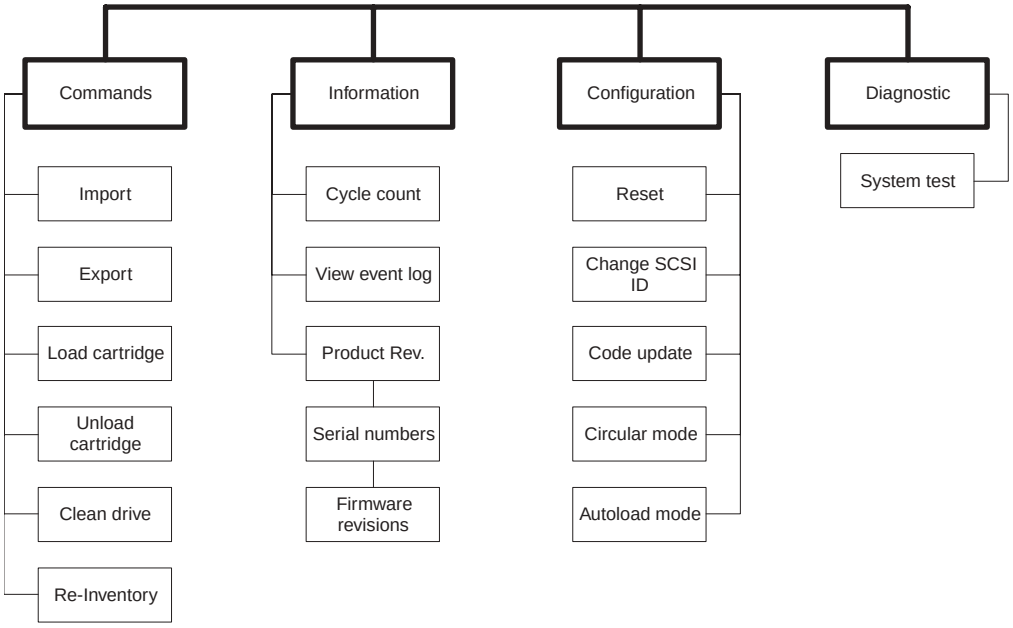
You use the keypad buttons to navigate the various menu options that are available. For more information, see "Menu options" on page 32.

Important

The keypad buttons are only available for use in interaction mode. For more information on operating modes, see "Operating modes" on page 34.

- CANCEL button [X] — Cancels an action and returns to the last menu item.
- PREVIOUS button [-] — Navigates through menu items.
- NEXT button [+] — Navigates through menu items.
- ENTER button — Goes to a sub-menu or forces a robotic action.

Menu options



Press the **ENTER** button to access the menu options from the Operator's Panel. Use the **PREVIOUS** and **NEXT** buttons to navigate through the menu items, then press **ENTER** to select the menu item. Use the **CANCEL** button to cancel the last action and return to the previous menu item.

For most installations, the default configuration for the autoloader does not need to be changed. However, you can access the Configuration menu from the Operator's Panel to change the SCSI IDs for the autoloader and the tape drive.

Important

The autoloader and the tape drive must each have unique SCSI IDs. Make sure that you do not assign duplicate IDs within a bus. For more information on changing SCSI IDs, see "SCSI ID settings" on page 52.

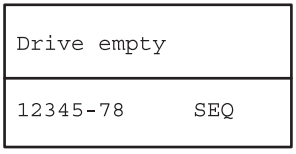
Inventory status characters

The inventory status characters represent the status of each slot within the tape drive. They appear in the second line of text on the LCD as an eight-character string, with four blank spaces on each side.

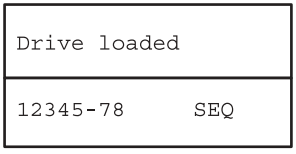
Inventory Status Characters

Character	Meaning
1 — 8	Slot Full: Indicates that slot contains a cartridge.
–	Slot Empty: Indicates the slot does not contain a cartridge.
1 / ■	The slot number alternating with the block (■) character indicates that the cartridge is loaded in the drive or the cartridge is being loaded, unloaded, imported, or exported.
!	(Exclamation point and the Media Attention LED is on) The cartridge in that slot is faulty. An invalid cartridge is identified the same way.

If a drive does not contain any cartridges, the following appears on the LCD. In this example, there is no cartridge in slot 6.



If the autoloader detects that a cartridge is loaded when you turn it on, the following appears on the LCD. In this example, there is no cartridge in slot 6. If the cartridge in the drive came from slot 8, the 8 would be alternating with the block character.



Operating modes

The *system driven* mode is the normal mode of operation. In this mode, the Operator's Panel displays the status associated with the actions that were caused from commands issued through the drive's SCSI interface. Some of these actions, including loading, rewinding, and moving tape, appear.

When an Operator's Panel button is pressed and released, the Operator's Panel changes to *interaction* mode. In *interaction* mode, you can change settings for the autoloader.

Interaction mode continues for three minutes after you stop pressing buttons, or the requested robotic action stops. The Operator's Panel returns to *system driven* mode automatically.

The *system driven* mode has two operating modes — Random and Sequential. The operating mode used depends on whether automation software is controlling cartridges in the autoloader. Initially, the autoloader assumes you are not using automation software to control cartridge or drive activity. This is called *sequential* mode. If the autoloader detects that automation software is controlling tape drive activity, it switches to *random* mode automatically.

Important

"SEQ" appears on the LCD when the autoloader is in Sequential Mode. No message appears during Random mode.

The following sections provide more information about *sequential* and *random* modes.

Random mode

Random mode is the normal operating mode when a backup program is used. In random mode, the autoloader loads a cartridge into the drive when it receives the appropriate commands from the program. To use this mode, your backup program must support autoloaders. This support often requires an autoloader/library program module to be installed.

Sequential mode

Sequential mode is used when autoloader software is not available. In *sequential* mode, the autoloader loads and unloads tapes automatically. You specify which tape you want to be loaded first by using the autoloader Operator's Panel controls. (For more information on loading cartridges, see "Loading and unloading a cartridge" on page 28.)

When the first cartridge is full or unloaded, the autoloader removes the cartridge from the drive automatically, returns it to its original slot, and loads another cartridge into the next higher numbered slot that is available. For additional control over loading cartridges in *sequential* mode, you can set Circular and Autoload options from the autoloader's front panel.

Circular mode

This option is accessed from the Configuration menu. When *circular* mode is enabled, the autoloader reloads the original first cartridge in the sequence after it cycles through all available cartridges. If *circular* mode is disabled, the autoloader stops loading cartridges after the last cartridge has been unloaded and waits until you load another cartridge manually.

Caution

Use caution with circular mode because it can overwrite data on previously written cartridges.

Autoload mode

This option is accessed from the Configuration menu. When *autoload* mode is enabled, the autoloader automatically loads the cartridge from the lowest numbered full slot into the tape drive when you turn the autoloader on. It then follows standard sequential operation.

Autoloader operations

After you install and configure the autoloader and install your program on the host computer, the autoloader performs most operations automatically. Operator intervention includes the following activities:

- Monitoring autoloader operation and status
- Performing autoloader and tape drive operations

Monitoring the autoloader operation and status

During normal operation, the Status screen appears on the LCD. You can use this screen to monitor autoloader activities. By default, the Status screen displays the current operating status of the autoloader and tape drive.

To set the Operator's Panel to *interaction* mode, press any key. This mode lets you use the keypad to display options for issuing commands to the autoloader, viewing information screens, and configuring the autoloader.

Performing autoloader and tape drive operations

The *Commands* menu provides options for importing and exporting cartridges, loading and unloading a cartridge from the tape drive, cleaning the tape drive, and updating the cartridge inventory. For more information on data cartridges, see "Data cartridges" on page 27.

Resetting the autoloader

A reset causes the autoloader to perform its power-on self-test (POST) and check for the presence of data cartridges. You can reset the autoloader in any of the following ways:

- Power-on reset — Turning the autoloader off (or unplugging it), then turning it back on again resets the autoloader and the tape drive.
- Operator's Panel — Select the **Configuration** menu, press **ENTER**, select **Reset**, then press **ENTER**. For more information on using the Operator's Panel, see "The Operator's Panel" on page 13.

Resetting the tape drive does not eject a cartridge loaded in the drive. If a cartridge is in the tape drive during a reset, make sure that it is safe to overwrite the loaded cartridge before performing a backup. If you perform a backup without checking the loaded cartridge, you may lose important data from a previous backup.

Maintenance

The autoloader requires no routine maintenance except for cleaning.

Warning

Do not clean or lubricate any of the autoloader's mechanical assemblies. Lubricating may adversely affect the function of those parts.

Important

The autoloader warranty does not apply to failures of the autoloader when it is repaired by untrained or unauthorized service personnel.

Cleaning the tape drive

The tape drive requires regular cleaning with an LTO tape cleaning cartridge to maintain optimal performance. Following a regular cleaning schedule for your tape drive maximizes the reliability of your drive and the life of your LTO tape data cartridges.

Warning

Do not use cleaning cartridges other than a Gateway-approved LTO cleaning cartridge. Using other types of cleaning cartridges will void your warranty. Carefully follow all instructions and recommendations provided with the cleaning cartridge.

Important

The tape drive can also report its cleaning requirements to the program. Your program may notify you when the tape drive needs cleaning. See your program documentation for more information.

To clean the tape drive, make sure that there is an empty slot available to hold the cleaning cartridge. Select **Clean drive** from the **Commands** menu on the Operator's Panel. When you use this option, the autoloader imports a cleaning cartridge through the cartridge access port and inserts it into the tape drive. When the cleaning is complete, the tape drive ejects the cleaning cartridge and the autoloader returns it to the cartridge access port for removal.

You can also store a cleaning cartridge in one of the cartridge slots. You use the **Load** command from the **Commands** menu to move the slot containing the cleaning cartridge into position and load the cartridge into the tape drive. When the cleaning is complete, the tape drive ejects the cleaning cartridge and the autoloader returns it to the slot from which it originated. Although this alternative lets you always have the cleaning cartridge in the autoloader, it has following disadvantages:

- You must remember which slot your cleaning cartridge is in.
- The autoloader's data storage capacity is reduced by one cartridge.

Some programs may support automating the cleaning process by reserving a slot for a cleaning cartridge. See your program documentation.

Shipping the autoloader

If you need to ship the autoloader, use the original shipping carton and packing materials to prevent damage. The shipping carton and packing materials are not intended to be used for shipping items other than the autoloader.

Troubleshooting and Diagnostics

5

The autoloader includes features to support troubleshooting and diagnostic operations. If an autoloader error occurs, an error message and error code are displayed on the Operator's Panel.

Additional diagnostic tests and firmware upgrade capability are included in the diagnostic software on the Resource CD.

Performing a system test

The *System Test* option cycles the autoloader through the process of loading, calibrating, and unloading all cartridges in the carousel. Running a system test verifies the basic operational soundness of the autoloader and tape drive. The system test continues indefinitely until you press the **CANCEL** button. All regular backup or restore operations are suspended while a system test is in progress.

To run a system test:

1. From the main menu, press the **NEXT** [+] or **PREVIOUS** [-] button until *Diagnostics* appears on the top line of the LCD.
2. Press the **ENTER** button. *System Test* appears.
3. Press the **Enter** button to begin the test. The Test Count displays the number of load-calibrate-unload cycles that have been completed during the test.
4. Press the **CANCEL** button to end the test.

Error codes

Overview of Error Codes

Error code hex notation	Error belonging to
80 - 8F	Robotic control errors
90 - 96	Function errors
A0 - A5	Low level axis errors
B0 - B7	Electronic hardware errors
BA - BF	Drive errors

Robotic control errors

Error code hex notation	Description
80	No error.
81	Invalid command error. This error indicates that the Loader received an undefined command or an invalid parameter to a command.
82	Device status not suitable to execute this command. If the robotics are busy, some commands cannot be executed at the same time. This error will indicate a probable violation. This is not an error condition, but does result in busy being reported to the host for the requested SCSI command.
83	Inventory not valid. The cartridge inventory is not valid because of manual changes or previous fatal errors. In this case, the inventory must be updated by appropriate ‘Set Slot Status’ commands.
84	Source element not ready. The transport source element is empty.
85	Destination element not ready. The destination element is already full.

Error code hex notation	Description
86	Access door cannot be opened, preventing the removal of tape media.
87	Timeout. A timeout condition occurred.
88	Communications error during loop-back.
89	Timeout detected by loader on BHC testing.
8F	No error after autoloader recovery.

Function errors

Error code hex notation	Description
90	Mechanical initialization failure. The robotic was not able to get into its safe mechanical init position. Manual intervention will be necessary.
91	Scan failure. Fatal error during cartridge scan, building up inventory.
92	Preposition failed. Belt positioning error during 'Preposition' command.
93	Cartridge mount error. Movement of cartridge into drive failed.
94	Cartridge dismount error. Failure during cartridge removal and transport back to the slot.
95	Import error. Device was not able to finish import of new cartridge without error.
96	Export error. Fatal error during cartridge export.

Low level axis errors

Error code hex notation	Description
A0	Belt axis error. Error during cartridge carrier movement (position not found).
A1	Slider axis error. Transport slider unable to reach estimated position.
A2	Gripper position error. Gripper unable to reach position.
A3	Cartridge pick error. Missing cartridge during pick operation of gripper.
A4	Door function error. Slider door in front bezel not in requested position during device operation.
A5	Fan error. Loader processor has detected a fan error.

Electronic hardware errors

Error code hex notation	Description
B0	ROM error.
B1	RAM error.
B2	NVRAM error.
B3	CTC error.
B4	UART error.
B5	Display error.
B6	Memory error.
B7	Timeout on loader command.

Drive errors

Error code hex notation	Description
BA	Drive load timeout.
BB	Drive unload timeout.
BC	Over temperature problem.
BD	No connection to drive.
BE	Generic drive response error.
BF	Drive broken, needs repair.

Error and event log

The autoloader provides an internal error and event log with 64 entries. This log data is helpful for development and service purposes. The error and event log is accessible through the Operator's Panel and can be read out entry by entry.

Log level

The error log is available in different levels. This log level is selectable through the Operator's Panel, so you can decide whether you want detailed information over a short range of events or rough information over a large range of events.

Code	Description
0	Error log is disabled.
1	Only errors are reported.
2	Errors and internal robotic message codes are logged. The log gives an overview of the communication between the drive and the robotics.
3	Errors, commands, and scripts are reported. The scripts describe micro-movements of the robotics such as "move slider to position xx," "close gripper," "move belt," and so on. There are scripts for load, unload, import, export, and more. The internal number of the script and script line number are posted to each micro-movement log.

Code	Description
4	Errors, commands, scripts, and stop on trigger are logged. The first error which occurs stops the logging by switching to log level 0. This gives the possibility to fix the root cause of an error even if the error recovery is successful and the autoloader runs on.

Log entry

A negative number in the top line shows the current position in the error log.

Every log entry consists of a type identifier and two data bytes. This information is shown on the bottom line of the screen.

Entry: AA BB CC

- AA type identifier
- BB data type 1
- CC data byte 2

Example of error/event log display

EVENT -6		
03	A0	00

- Sequence number -6 indicates the position in the sequence list. Zero (0) is the most recent.
- The log shows a belt axis error (type identifier: 03 = error, data byte 1: A0 = belt axis error, data byte 2: 00 is not used).

The following entry modes can be assigned by the type identifier:

Entry modes

Type	Description
01	Internal robotic command message which is received by RobCtrl Module. Data byte 1 shows the command, data byte 2 means its first parameter (usually cartridge number).

Type	Description
02	Internal robotic command message which is received by RobTest Module. Data byte 1 shows the command, data byte 2 means its first parameter (usually cartridge number).
03	Indicates an error message. Errors are represented by the same codes as described before in this interface specification. Data byte 2 is not used in this mode.
04	Represents a motion script information. Data byte 1 points to the current script number, data byte 2 points to the last line executed in the script. The provided information is rather extensive and needs to be verified by the developer of the particular script.
05	Indicates a debug output. This type can be used by a software developer to fix special problems. Data byte 1 and data byte 2 are free for any usage and may depend on the investigated problem. This type will only be used during the development phase.

Before calling Gateway Technical Support

Before calling Gateway Technical Support, consider using Gateway's Internet technical support. Gateway's Web site has FAQs, tips, and other technical help. You can also use the Web site to e-mail Technical Support. For more information, visit Gateway's Technical Support Web site at support.gateway.com.

Telephone support

Gateway offers a wide range of customer service, technical support, and information services.

Telephone numbers

You can access the following services through your telephone to get answers to your questions:

Resource	Service description	How to reach
Fax on demand support	Order a catalog of documents on common problems, then order documents by document numbers. The documents will be faxed to you.	800-846-4526 (US) 877-709-2951 (Canada)
Gateway Technical Support	Talk to a Gateway Technical Support representative about a non-tutorial technical support question. (See "Before calling Gateway Technical Support" on page 49 before calling.)	877-485-1464 (US) 800-846-3609 (Canada and Puerto Rico) 605-232-2191 (all other countries)
	TDD Technical Support (for hearing impaired) is available: Weekdays 6:00 a.m. - 8:00 p.m. Central Time Weekends 6:00 a.m. - 5:00 p.m. Central Time	800-846-1778 (TDD)
Sales, accounting, and warranty	Get information about available systems, pricing, orders, billing statements, warranty service, or other non-technical issues.	800-846-2000 (US) 888-888-2037 (Canada)

Specifications A

Size and weight

Length: 24.0 inches (60.9 cm)

Width: 16.9 inches (42.9 cm)

Height: 3.3 inches (8.4 cm)

Weight: 19.5 pounds (8.8 kg) without cartridges installed

SCSI interface

The autoloader has a standard SCSI interface. One SCSI cable and one SCSI terminator are included with the autoloader. Additional cables and terminators can be ordered from Gateway.

Important

The LVD SCSI interface is compatible with a single-ended SCSI bus. However, do not attach the autoloader to a non-LVD SCSI controller because this will degrade the performance of the tape drive and the performance of your backups.

Do not attach non-LVD SCSI devices to the same bus cable as your autoloader because this will degrade the performance of the tape drive and the performance of your backups.

Do not connect the tape drive to a disk RAID controller because this is not supported.

If you are installing an adapter, we recommended that you purchase a SCSI LVD controller kit that includes a SCSI cable and SCSI terminator (unless provided with your autoloader).

We strongly recommended that you do not attach the autoloader to the same SCSI bus as your SCSI hard drive(s).

SCSI ID settings

The autoloader contains two SCSI ID settings — one for the autoloader's SCSI controller and one for the tape drive's SCSI controller. If there is another device already assigned to these IDs, you need to change the IDs. For more information, see "Changing the SCSI ID settings" on page 53.

SCSI ID Default Settings	
Autoloader	5
Tape drive	6

Changing the SCSI ID settings

To change the SCSI ID settings:

1. From the main menu, press the **PREVIOUS** or **NEXT** button until **Configuration** appears on the LCD.
2. Press **ENTER** to select the **Configuration** menu.
3. Press the **PREVIOUS** or **NEXT** button until *Change SCSI ID* appears on the LCD.
4. Press **ENTER** to select the **Change SCSI ID** option.
5. Press the **PREVIOUS** or **NEXT** button until *Loader* or *Drive* appear on the LCD.
6. Press **ENTER** to select the **Loader** or **Drive** option.
7. Press the **PREVIOUS** or **NEXT** button until the SCSI ID you want appears.
8. Press the **ENTER** button. *Cycle Power for New SCSI ID* appears on the LCD.
9. Turn off the autoloader. Wait a few seconds, then turn the autoloader on again. The selected SCSI ID is now set.

Important

If you change the SCSI ID, you may also need to turn the host server off and on, and reconfigure your backup program before you can use the autoloader. The autoloader and the tape drive must each have unique SCSI IDs. Make sure that you do not assign duplicate IDs within a bus.

SCSI cable requirements

We recommend using 68-pin SCSI cables that conform to SCSI-3 specifications.

Warning

All wide SCSI configurations (single-ended, LVD, and HVD) use the same 68-pin connector. Attaching the autoloader directly to an HVD SCSI will make the entire bus non-functional and may permanently damage the drive or other SCSI devices on the bus.

Important

To comply with the safety and regulatory agency standards for the autoloader, all SCSI cables you use with the autoloader must be correctly shielded.

SCSI cable length

The maximum allowable cable length for a low-voltage differential SCSI bus, including all internal and external cables, is specified as follows:

- If you have more than two devices on the LVD bus, the maximum allowable length is 39 feet (12 meters).
- If you are making a point-to-point connection (target and initiator only), the maximum length is 82 feet (25 meters).

Important

The autoloader and the tape drive are independent SCSI devices on the same SCSI bus. As a result, when they are connected to the initiator, there are a minimum of three devices attached to the SCSI bus. Therefore, the maximum allowable cable length is 39 feet (12 meters).

- To determine the cable length of the bus, measure the lengths of all external SCSI cables. Add those lengths together. To that sum, add 26.8 inches (68 centimeters) for the internal SCSI cable length.

SCSI terminator requirements

If the autoloader or the tape drive is the last device on the SCSI bus, you must install an external, wide LVD terminator on the unused SCSI connector. Do not use internal terminators to terminate the autoloader or the tape drive. We recommend using a SCSI-3 type SE/LVD multi-mode terminator.

Important

We recommend using active termination. Testing has shown that older passive termination does not provide rising edge transitions that are fast enough or clean enough at fast SCSI speeds.

Performance specifications

Capacity

The autoloader can accommodate as many as eight LTO tape cartridges. The storage capacity of the autoloader depends on the type of cartridge and the type of data being stored.

Tape drive performance

When installed in the autoloader, the tape drive performs within its specifications. A minimum of an Ultra2 LVD-capable controller that can transfer data at least 80 MB/second is required. For more information about tape drive performance specifications, see “Specifications” on page 51.

Autoloader self-test times

Each time the autoloader is turned on, it performs a power-on self-test (POST). POST includes a self-test of the control electronics, initialization of the mechanical components, and a cartridge inventory. The POST time is measured from the time the autoloader is turned on until the autoloader indicates Ready status. The maximum time required for POST is 65 seconds.

The autoloader also performs a self-test when you select **Library Test** from the Operator’s Panel or in response to a SEND DIAGNOSTICS SCSI command. The maximum time required for this self-test is nine seconds.

If the cartridges are correctly installed, the autoloader is ready for operation after performing either a POST or a self-test. If the autoloader encounters a problem during a POST or the self-test, it reports an error on the LCD.

Initial element status time

When an initiator sends an INITIALIZE ELEMENT STATUS (IES) command, the autoloader checks each cartridge slot for the presence of a cartridge. The autoloader requires 21 seconds to perform an IES command.

Move complete time

Move Complete Time is measured from the time the autoloader receives a move command to the time it returns status to the initiator indicating that the move is complete. The average time required for the autoloader to move the cartridge slot into position in front of the tape drive and either insert or remove the cartridge from the tape drive is less than 45 seconds.

Reliability

The mean cycles between failures (MCBF) for the autoloader's robot is 250,000 cycles. This value does not include failures attributable to the tape drive or cartridges.

During one full cycle, the cartridge loader completes the following actions:

1. Picks the cartridge from a cartridge slot.
2. Places the cartridge in the tape drive.
3. Removes the cartridge from the tape drive.
4. Replaces the cartridge in the cartridge slot.

Power specifications

AC power

The autoloader has automatic AC input voltage selection and accepts the input voltages shown in the following table. The autoloader is capable of continuous operation when the AC power experiences intermittent operation, voltage surges, and voltage spikes.

Input voltage	100 to 240 V AC ±10%,47 to 63 Hz
Input voltage	100 to 240V AC ±10%, 47 to 63 Hz
Power consumption:	
▪ Average while idle	▪ 20 watts
▪ Average while operating	▪ 35 watts
▪ Maximum while operating	▪ 70 watts
▪ Average heat output while operating (based on the AC true power consumption)	▪ 119.4 BTU/hour

AC power cord

The autoloader comes with a 7-foot (2.1-meter), three-conductor, 18 AWG power cord for 120 volt use in the United States and Canada. The power cord has a molded NEMA 5-15P connector on one end and a molded IEC 320/EN 60320 connector on the other end. The power cord is UL Listed and CSA Certified.

United States and Canada — 120 VAC power cord

- The power cord must have a molded NEMA 6-15P attachment plug on one end.
- The power cord must have a molded EC 320/EN 60320 connector on the other end.
- The cordage must be an SJT or SVT type, 3-conductor, 18 AWG minimum.
- The power cord must comply with local electrical code.

Environmental specifications

Specification	Operating (1)	Storage (2) or non-operating (3)	Transportation (4)
Ambient temperature range	+50° F to +104° F (+10° C to +40° C)	-40° F to +140° F (-40° C to +60° C)	-4° F to +140° F (-20° C to +60° C)
Temperature variation (5) (thermal gradient)	2° F per minute; max 18° F per hour (1° C per minute; max 10° C per hour)	1° F per minute; max 36° F per hour (1° C per minute; max 20° C per hour)	2° F per minute; max 36° F per hour (1° C per minute; max 20°C per hour)
Relative humidity (humidity gradient)	20% to 80%; Non-condensing 10% per hour	10% to 80%; Non-condensing 10% per hour	10% to 80%; Non-condensing 10% per hour
Wet bulb	79° F (26° C) max	84° F (29° C) max	84° F (29° C) max
Altitude	-1000 ft. to +30,000 ft. (-304.8 m to +9,144 m)	-1000 ft. to +30,000 ft. (-304.8 m to +9,144 m)	-1000 ft. to +30,000 ft. (-304.8 m to +9,144 m)

(1) All operating specifications include a data cartridge. These measurements assume that the autoloader is installed in accordance with the installation instructions.

(2) The autoloader is in its original packaging.

(3) The autoloader has been unpacked but is still in its protective antistatic bag. The packaging is designed to protect the autoloader from the condensation caused by extreme temperature variations (15° C or more). When the autoloader is moved from a cold storage environment to a warm operating environment, it must acclimate in its packaging for at least 12 hours before opening to prevent serious condensation damage from occurring.

(4) The autoloader has not been unpacked. The transportation period does not exceed 72 hours.

(5) The data cartridges must be allowed to stabilize in the specified ambient temperature and humidity for 24 hours before use.

Acoustic noise limits

The overall, averaged A-weighted sound pressure level (in decibels) for the autoloader does not exceed the upper limits specified in the following table.

Operating mode	LpA (1)
The autoloader is turned on and idle.	55 dBA
The autoloader is operational (the carousel or cartridge loader is moving) and the tape drive is in streaming mode.	55 dBA (2)

(1) LpA is the average A-weighted sound pressure level over the following frequency range: 5 Hz to 12.5 KHz.

(2) Represents a maximum sustained operational level.

Shock and vibration

Shock specifications

The autoloader will operate normally after experiencing shock loads as specified in the following table. The operating shock levels indicate how much shock the autoloader can withstand while the enclosed tape drive is reading and writing data. The non-operating and storage shock levels indicate how much shock the autoloader can withstand when it is not operating. After experiencing this amount of shock, the autoloader will operate normally.

Operating (1)	Storage (2) or non-operating (3)	Transportation (2)
3 g for 5 msec (4)	45 g at 152 in/sec (5)	ISTA Procedure 2A

(1) The autoloader is unpacked and is picking and placing cartridges from the cartridge slots and tape drive.

(2) The autoloader has not been unpacked.

(3) The autoloader has been unpacked, but it is not turned on.

(4) A minimum of 20 shock pulses were applied to the bottom/top axis. The shock pulses were half-sine waves and were applied at a rate not exceeding one shock per second.

(5) A minimum of three 45 g shock pulses were applied to each of the autoloader's six sides.

Vibration specifications

The following table shows the vibration specifications for the autoloader during operation, non-operation, storage, and transportation. The operating specifications indicate the amount of vibration the autoloader can withstand while the enclosed tape drive is reading and writing data.

Random vibration (1) applied during operation	
1 Hz	PSD = 0.0000040 g2/Hz
5 Hz	PSD = 0.0000270 g2/Hz
10-150 Hz	PSD = 0.0004048 g2/Hz
200-400 Hz	PSD = 0.0001079 g2/Hz
Random vibration (2) applied during non-operation (3) and storage (4)	
1 Hz	PSD = 0.0003 g2/Hz
3 Hz	PSD = 0.00055 g2/Hz
12-100 Hz	PSD = 0.01 g2/Hz
400 Hz	PSD = 0.000003 g2/Hz
Transportation (4)	
ISTA Procedure 2A	
Swept sine applied during non-operation (5) and operating (6)	
5 to 500 to 5 Hz	

(1) A 0.3 g rms random vibration spectrum is applied to the bottom/top axis for a minimum of 20 minutes per axis.

(2) A 1.06 g rms random vibration spectrum is applied to each of three orthogonal axes for a minimum of 20 minutes per axis.

(3) The autoloader has been unpacked, but is not operating.

(4) The autoloader is packaged in its original shipping container.

(5) Three sweeps at one octave per minute are applied to each axis at 0.75 g (0 . peak) input.

(6) Three sweeps at one octave per minute are applied to the top/bottom axis at 0.3 g (0 . peak) input.

Regulatory Compliance and Legal Information

B

Regulatory compliance statements

United States of America

Federal Communications Commission (FCC)
Unintentional emitter per FCC Part 15

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio or television reception. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio and television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment to an outlet on a different circuit from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help.

Caution

Changes or modifications not expressly approved by Gateway could void the FCC compliance and negate your authority to operate the product.

Canada

Industry Canada (IC)
Unintentional emitter per ICES-003

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of Industry Canada.

Le présent appareil numérique n’émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe B prescrites dans le règlement sur le brouillage radioélectrique édicté par Industrie Canada.

California Proposition 65 Warning

Warning

This product contains chemicals, including lead, known to the State of California to cause cancer and/or birth defects or reproductive harm.

Notices

14303 Gateway Place
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